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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE340

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Dock Replacement Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that we have issued an incidental harassment authorization (IHA) to UniSea, Inc. (UniSea) to incidentally harass, by Level B harassment only, small numbers of marine mammals during construction activities associated with a dock replacement project in Iliuliuk Harbor, Unalaska, AK.

DATES: This authorization is effective from March 1, 2016, through February 28, 2017.

FOR FURTHER INFORMATION CONTACT: Jordan Carduner, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of UniSea's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at:

www.nmfs.noaa.gov/pr/permits/incidental/. In case of problems accessing these documents, please call the contact listed under **FOR FURTHER INFORMATION CONTACT**.

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth.

The allowance of such incidental taking under section 101(a)(5)(A), by harassment, serious injury, death, or a combination thereof, requires that regulations be established. Subsequently, a Letter of Authorization may be issued pursuant to the prescriptions established in such regulations, providing that the level of taking will be consistent with the findings made for the total taking allowable under the specific regulations. Under section 101(a)(5)(D), NMFS may authorize such incidental taking by harassment only, for periods of not more than one year,

pursuant to requirements and conditions contained within an IHA. The establishment of these prescriptions requires notice and opportunity for public comment.

NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as: "…any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]."

Summary of Request

On June 10, 2015, we received a request from UniSea for authorization to take marine mammals incidental to pile driving and pile removal associated with construction of a commercial fishing dock in Iliuliuk Harbor, a small harbor in the Aleutian Islands. UniSea submitted revised versions of the request on September 28, 2015, and December 2, 2015. The latter of these was deemed adequate and complete. UniSea proposed to replace the existing dock with an 80 foot by 400 foot open cell sheet pile dock, between March 1, 2016 and February 28, 2017.

The use of both vibratory and impact pile driving is expected to produce underwater sound at levels that have the potential to result in behavioral harassment of marine mammals. Species with the expected potential to be present during all or a portion of the in-water work

window include the Steller sea lion (*Eumetopias jubatus*) and harbor seal (*Phoca vitulina*). These species may occur year-round in Iliuliuk Harbor.

Description of the Specified Activity

A detailed description of the proposed G1 dock construction project is provided in the **Federal Register** notice for the proposed IHA (80 FR 79822; December 23, 2015). Since that time, no changes have been made to the proposed dock construction activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to UniSea was published in the **Federal Register** on December 23, 2015 (80 FR 79822). That notice described, in detail, UniSea's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission. The Marine Mammal Commission recommended that NMFS issue the IHA, subject to inclusion of the proposed mitigation, monitoring, and reporting measures.

Description of Marine Mammals in the Area of the Specified Activity

Marine waters near Unalaska Island support many species of marine mammals, including pinnipeds and cetaceans; however, the number of species regularly occurring near the project location is limited. There are three marine mammal species under NMFS' jurisdiction with recorded occurrence in Iliuliuk Harbor during the past 15 years, including one cetacean and two pinnipeds. Steller sea lions are the most common marine mammals in the project area and are

part of the western Distinct Population Segment (DPS) that is listed as Endangered under the Endangered Species Act (ESA). Harbor seals (*Phoca vitulina*) may also occur in the project area, though less frequently and in lower abundance than Steller sea lions. The humpback whale (*Megaptera novaeangliae*), although seasonally abundant in Unalaska Bay, is not typically present in Iliuliuk Harbor. A single humpback whale was observed beneath the bridge that connects Amaknak Island and Unalaska Island, moving in the direction of Iliuliuk Harbor, in September 2015 (pers. comm., L. Baughman, PND Engineers, to J. Carduner, NMFS, Oct. 12, 2015); no other sightings of humpback whales in Iliuliuk Harbor have been recorded and no records are found in the literature. In the summer months, the majority of humpback whales from the central North Pacific stock are found in the feeding grounds of the Aleutian Islands, Bering Sea, Gulf of Alaska, and Southeast Alaska/northern British Columbia, with high densities of whales found in the eastern Aleutian Islands, including along the north side of Unalaska Island (Allen and Angliss 2014). Despite their relatively high abundance in Unalaska Bay during summer months, their presence within Iliuliuk Harbor is sufficiently rare that we do not believe there is a reasonable likelihood of their occurrence in the project area during the period of validity for the IHA. Thus the incidental harassment of humpback whales as a result of the G1 dock construction project is not authorized in the IHA; as such, the humpback whale is not carried forward for further analysis beyond this section.

We have reviewed UniSea's detailed species descriptions, including life history information, for accuracy and completeness and refer the reader to Sections 3 and 4 of UniSea's application, rather than reprinting the information here. In addition, a detailed description of the species likely to be affected by the UniSea G1 dock construction project, including brief

introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (80 FR 79822; December 23, 2015); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (*www.nmfs.noaa.gov/pr/species/mammals/*) for generalized species accounts.

Table 1 lists the marine mammal species with expected potential for occurrence in the vicinity of the project during the project timeframe and summarizes key information regarding stock status and abundance. Taxonomically, we follow Committee on Taxonomy (2015). Please see NMFS' Stock Assessment Reports (SAR), available at *www.nmfs.noaa.gov/pr/sars*, for more detailed accounts of these stocks' status and abundance. The harbor seal and Steller sea lion are addressed in the Alaska SARs (e.g., Allen and Angliss, 2012, 2014).

Table 1. Marine mammals potentially present in the vicinity of the project location.

Species	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV; N_{min}; most recent abundance survey)[2]	PBR[3]	Annual M/SI[4]	Relative occurrence in Iliuliuk Harbor; season of occurrence
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	Western U.S.	E/D; N	55,422 (n/a; 48,676; 2008-11)	292	234.7	common; year-round (greater abundance in summer)
Family Phocidae (earless seals)						
Harbor seal	Aleutian Islands	-; N	3,579[5] (0.092; 3,313; 2004)	99	93.1	occasional; year-round

[1]ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR (see footnote 3) or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2]CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For killer whales, the abundance values represent direct counts of individually identifiable animals; therefore there is only a single abundance estimate with no associated CV. For certain stocks of pinnipeds, abundance estimates are based upon observations of animals (often pups) ashore multiplied by some correction factor derived from knowledge of the species (or similar species) life history to arrive at a best abundance estimate; therefore, there is no associated CV. In these cases, the minimum abundance may represent actual counts of all animals ashore.

[3]Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

[4]These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, subsistence hunting, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value.

[5]Abundance estimate for this stock is greater than ten years old and is therefore not considered current. We nevertheless present the most recent abundance estimate, as this represents the best available information for use in this document.

Potential Effects of the Specified Activity on Marine Mammals

The effects of underwater noise from in-water construction activities for the UniSea G1 dock construction project have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (80 FR 79822; December 23, 2015) included a discussion of the effects of anthropogenic noise on marine mammals, therefore that information is not repeated here; please refer to that **Federal Register** notice for that information. No instances of hearing threshold shifts, injury, serious injury, or mortality are expected as a result of the in-water construction activities.

Anticipated Effects on Habitat

The main impact associated with the UniSea G1 dock construction project would be temporarily elevated sound levels and the associated direct effects on marine mammals. The project would not result in permanent impacts to habitats used directly by marine mammals, such as haul-out sites, but may have potential short-term impacts to food sources such as forage fish and salmonids, and minor impacts to the immediate substrate during installation and removal of piles during the dock construction project. These potential effects are discussed in detail in the

Federal Register notice for the proposed IHA (80 FR 79822; December 23, 2015), therefore that information is not repeated here; please refer to that **Federal Register** notice for that information.

Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

For the G1 dock construction project, NMFS is requiring UniSea to implement the following mitigation measures to minimize potential impacts to marine mammals in the project vicinity as a result of in-water construction activities.

Monitoring and Shutdown for Pile Driving

Measurements from similar pile driving events were coupled with practical spreading loss to estimate Level A and Level B harassment zones (see "Estimated Take by Incidental Harassment"). These values were then used to develop mitigation measures for pile driving activities. The Level A zone effectively represents the mitigation zone that would be established around each pile to prevent Level A harassment to marine mammals, while the Level B zone provides estimates of the areas within which Level B harassment might occur as a result of noise associated with in-water construction. While the Level A and Level B harassment zones vary between different types of construction methods, UniSea will establish mitigation zones for the maximum possible Level A and Level B zones for all construction activities conducted in

support of the project. Note that in the **Federal Register** notice for the proposed IHA (80 FR 79822; December 23, 2015), the mitigation and monitoring zones were referred to as the "exclusion zone" and "zone of influence"; we have since changed the names of the zones for clarity.

The following measures would apply to UniSea's mitigation through the Level A and Level B harassment zones:

Level A Zone – For all pile driving activities, UniSea will establish a Level A zone intended to contain the area in which SPLs equal or exceed the 190 dB rms acoustic injury criteria for pinnipeds. The purpose of the Level A zone is to define an area within which shutdown of construction activity would occur upon sighting of a marine mammal within that area (or in anticipation of an animal entering that area), thus preventing potential injury of marine mammals. Modeled distances to the Level A threshold are shown in Table 3. UniSea would implement a minimum 10 m radius Level A zone for all pile driving and down-the-hole drilling activities. See Appendix B in the IHA application for figures showing the Level A zones overlaid on satellite images of the project area.

Level B Zones – The Level B zones refer to the areas in which SPLs equal or exceed 160 and 120 dB rms (for pulsed and non-pulsed continuous sound, respectively). Level B zones provide utility for monitoring that is conducted for mitigation purposes (i.e., shutdown monitoring) by establishing monitoring protocols for areas adjacent to the Level A zone. Monitoring of the Level B zones enable observers to be aware of, and communicate about, the presence of marine mammals within the project area but outside the Level A zone, and thus prepare for potential shutdowns of activity should those marine mammals approach the Level A

zone. However, the primary purpose of monitoring in the Level B zones is to allow documentation of incidents of Level B harassment; monitoring of Level B zones is discussed in greater detail in the Marine Mammal Monitoring Plan which, available at: *www.nmfs.noaa.gov/pr/permits/incidental/*. The modeled radial distances for Level B zones for impact and vibratory pile driving and removal (not taking into account landmasses which are expected to limit the actual Level B zone radii) are shown in Table 3.

In order to document observed incidents of harassment, monitors will record all marine mammals observed within the modeled Level B zones. Modeling was performed to estimate the Level B zone for impact pile driving (the areas in which SPLs are expected to equal or exceed 160 dB rms during impact driving) and for vibratory pile driving (the areas in which SPLs are expected to equal or exceed 120 dB rms during vibratory driving and removal). Results of this modeling showed the Level B zone for impact driving would extend to a radius of 900 m from the pile being driven, the Level B zone for vibratory pile driving and down-the-hole drilling (if it occurs) would extend to a radius of 10,000 m from the pile being driven, and the Level B zone for vibratory pile removal would extend to a radius of 7,400 m from the pile being removed. However, due to the geography of the project area, landmasses surrounding Iliuliuk Harbor are expected to limit the propagation of sound from construction activities such that the actual distances to the extents of the Level B zones for all construction activities will be substantially smaller than those described above. Modeling results of the ensonified areas, taking into account the attenuation provided by landmasses, suggest the actual Level B zones will extend to a maximum distance of 1,300 m from the G1 dock, at the furthest point (for vibratory driving). Due to this relatively small modeled Level B zones, and due to the monitoring locations chosen

by UniSea, we expect that monitors will be able to observe the entire modeled Level B zones for both impact and vibratory pile driving, and thus we expect data collected on incidents of Level B harassment to be relatively accurate. The modeled areas of the Level B zones for impact and vibratory driving, taking into account the attenuation provided by landmasses in attenuating sound from the construction project, and the monitoring locations, are shown in Marine Mammal Monitoring Plan, available at: *www.nmfs.noaa.gov/pr/permits/incidental/*.

Shutdown Measures

UniSea will implement shutdown measures if a Steller sea lion or harbor seal is sighted in, or approaching, the Level A zone. In-water construction activities would be suspended until the Steller sea lion or harbor seal is observed leaving the Level A zone voluntarily and has been visually confirmed beyond the Level A zone, or 15 minutes has elapsed without re-detection of the animal in the Level A zone. Shutdown of construction operations will also occur if a species for which authorization has not been granted (including humpback whales) approaches or is observed within the Level B harassment zone; in-water construction activities would be suspended until the animal is observed leaving the Level B zone voluntarily and has been visually confirmed beyond the Level B harassment zone, or 15 minutes (in the case of pinnipeds) or 30 minutes (in the case of cetaceans) has elapsed without re-detection of the animal in the Level B harassment zone. In addition, shutdown of construction operations will also occur if the number of takes authorized for Steller sea lions or harbor seals have been met, and a Steller sea lion or harbor seal approaches, or is observed within, the Level B harassment zone; in-water construction activities would be suspended until the Steller sea lion or harbor seal is observed leaving the Level B zone voluntarily and has been visually confirmed beyond the Level B

harassment zone, or 15 minutes has elapsed without re-detection of the animal in the Level B harassment zone.

Observations of Steller sea lions and harbor seals outside the Level A zone will not result in shutdown of construction operations, unless the Steller sea lion or harbor seal approaches or enters the Level A zone, or unless authorized take numbers for Steller sea lions or harbor seals has already been exceeded as described above, at which point all pile driving activities will be halted.

Monitoring Protocols – Monitoring will be conducted before, during, and after pile driving activities. Monitoring will take place from 30 minutes prior to initiation of pile driving or pile removal through 30 minutes post-completion of pile driving or removal activities. Pile driving and removal activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes. Please see the Marine Mammal Monitoring Plan (available at *www.nmfs.noaa.gov/pr/permits/incidental/*), for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

(1) Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are will have the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance;

- Experience and ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors, with ability to accurately identify marine mammals in Alaskan waters to species;
- Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the Level A and Level B zone will be monitored for thirty minutes to ensure that the Level A zone is clear of all marine mammals and the Level B zone is clear of marine mammals other than Steller sea lions and harbor seals. Pile driving will only commence once observers have declared the Level A zone is clear of all marine mammals and the Level B zone is clear of all marine mammals under NMFS jurisdiction with the exception of Steller sea lions and harbor seals; animals will be allowed to remain in the respective exclusion zones (i.e., must leave of their own volition) and their behavior will be monitored and documented. The respective exclusion zones may only be declared clear, and pile driving started, when the entire Level B zone is visible (i.e., when not obscured by dark, rain, fog, etc.). In addition, if such conditions should arise during impact pile driving that is already underway, the activity will be halted.

(3) If a Steller sea lion or harbor seal enters or approaches the Level A zone, or, if a marine mammal other than Steller sea lion or harbor seal enters or approaches the Level B zone, during the course of pile driving operations, activity will be halted and delayed until either the

animal has voluntarily left the respective zone and been visually confirmed beyond the respective zone, or fifteen minutes have passed without re-detection of the animal in the case of pinnipeds, or thirty minutes have passed without re-detection of the animal in the case of cetaceans. Monitoring will be conducted throughout the time required to drive a pile.

Sound Attenuation Devices

UniSea will use bubble curtains, which create a column of air bubbles rising around a pile from the substrate to the water's surface, as a sound attenuation device. The air bubbles absorb and scatter sound waves emanating from the pile, thereby reducing the sound energy. Unconfined bubble curtains will be used during all impact pile driving associated with the G1 dock construction project. A discussion of bubble curtains and their anticipated effectiveness is included in the **Federal Register** notice for the proposed IHA (80 FR 79822; December 23, 2015), therefore that information is not repeated here; please refer to that **Federal Register** notice for that information.

Soft Start

The use of a "soft-start" procedure is believed to provide additional protection to marine mammals by providing a warning and an opportunity to leave the area prior to the hammer operating at full capacity. For vibratory hammers, the soft start technique will initiate noise from the hammer for 15 seconds at a reduced energy level, followed by 1- minute waiting period and repeat the procedure two additional times. For impact hammers, the soft start technique will initiate three strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would also be repeated two additional times. The actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in "bouncing" of

the hammer as it strikes the pile, resulting in multiple "strikes." Soft start for impact driving will be required at the beginning of each day's pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

We have carefully evaluated UniSea's proposed mitigation measures and considered their likely effectiveness relative to implementation of similar mitigation measures in previously issued IHAs to determine whether they are likely to affect the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

(1) The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;

(2) The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

(3) The practicability of the measure for applicant implementation.

Any mitigation measure(s) we prescribe should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

(1) Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

(2) A reduction in the number (total number or number at biologically important time or location) of individual marine mammals exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(3) A reduction in the number (total number or number at biologically important time or location) of times any individual marine mammal would be exposed to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing takes by behavioral harassment only).

(4) A reduction in the intensity of exposure to stimuli expected to result in incidental take (this goal may contribute to 1, above, or to reducing the severity of behavioral harassment only).

(5) Avoidance or minimization of adverse effects to marine mammal habitat, paying particular attention to the prey base, blockage or limitation of passage to or from biologically important areas, permanent destruction of habitat, or temporary disturbance of habitat during a biologically important time.

(6) For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of UniSea's proposed measures, we have determined that the mitigation measures provide the means of affecting the least practicable impact on marine mammal species or stocks and their habitat.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for incidental take authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of

taking or impacts on populations of marine mammals that are expected to be present in the project area.

Any monitoring requirement we prescribe should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within defined zones of effect (thus allowing for more effective implementation of the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

2. An increase in our understanding of how many marine mammals are likely to be exposed to stimuli that we associate with specific adverse effects, such as behavioral harassment or hearing threshold shifts;

3. An increase in our understanding of how marine mammals respond to stimuli expected to result in incidental take and how anticipated adverse effects on individuals may impact the population, stock, or species (specifically through effects on annual rates of recruitment or survival) through any of the following methods:

- Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict pertinent information, e.g., received level, distance from source);
- Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict pertinent information, e.g., received level, distance from source); and
- Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli.

4. An increased knowledge of the affected species; or

5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

UniSea submitted a marine mammal monitoring plan as part of their IHA application (the monitoring plan can be viewed online at: *www.nmfs.noaa.gov/pr/permits/incidental/*). UniSea's marine mammal monitoring plan was created with input from NMFS and was based on similar plans that have been successfully implemented by other action proponents under previous IHAs for pile driving projects.

Visual Marine Mammal Observations

UniSea will collect sighting data and will record behavioral responses to construction activities for marine mammal species observed in the project location during the period of activity. All marine mammal observers (MMOs) will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. UniSea will monitor the Level A and Level B harassment zones before, during, and after pile driving, with observers located at the best practicable vantage points. See Figure 2 in the Marine Mammal Monitoring Plan for the observer locations planned for use during construction. Based on our requirements, the Marine Mammal Monitoring Plan would implement the following procedures for pile driving:

- Observers will report directly to the monitoring coordinator if/when a shutdown is deemed necessary due to marine mammals approaching the Level A or Level B harassment zones. An employee of the construction contractor will be identified as the monitoring coordinator at the start of each construction day. Shutdowns will be implemented immediately

upon an observer reporting a marine mammal in, or approaching, the Level A zone; or, upon an observer reporting a marine mammal under NMFS's jurisdiction other than a Steller sea lion or harbor seal in, or approaching, the Level B zone.

- MMOs will be located at the best vantage point(s) in order to properly observe the entire Level A and Level B zones. A minimum of two MMOs will be on duty during all pile driving activity, with one of these MMOs having full time responsibility for monitoring the Level A zone.
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals.
- If the Level A or Level B zones are obscured by fog or poor lighting conditions, pile driving will not be initiated until the Level A and Level B zones are clearly visible. Should such conditions arise while impact driving is underway, the activity would be halted.
- The Level A or Level B zones will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. MMOs will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and UniSea.

Data Collection

We require that observers use approved data forms. Among other pieces of information, UniSea will record detailed information about any implementation of shutdowns, including the distance of animals to the pile being driven, a description of specific actions that ensued, and

resulting behavior of the animal, if any. In addition, UniSea will attempt to distinguish between the number of individual animals taken and the number of incidents of take, when possible. We require that, at a minimum, the following information be collected on sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (e.g., percent cover, visibility);
- Water conditions (e.g., sea state, tide state);
- Species, numbers, and (if possible) sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from marine mammal(s) to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting

A draft report will be submitted within 90 calendar days of the completion of the activity, or within 45 calendar days prior to the effective date of a subsequent IHA (if applicable). The report will include information on marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of any mitigation shutdowns and results of those actions, as well as an estimate of total take based on the number

of marine mammals observed during the course of construction. A final report must be submitted within 30 days following resolution of comments from NMFS on the draft report.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner not authorized by the IHA, such as a Level A harassment, or a take of a marine mammal species other than those authorized, UniSea will immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources. The report would include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with UniSea to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. UniSea would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that UniSea discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition), UniSea would immediately report the incident tomailto: the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Stranding Coordinator.

The report would include the same information identified in the paragraph above. Construction related activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with UniSea to determine whether modifications in the activities are appropriate.

In the event that UniSea discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), UniSea would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Stranding Coordinator, within 24 hours of the discovery. UniSea would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as: "…any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing

disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]."

All anticipated takes would be by Level B harassment, resulting from vibratory and impact pile driving and involving temporary changes in behavior. Based on the best available information, the activities—vibratory and impact pile driving—would not result in serious injuries or mortalities to marine mammals even in the absence of the mitigation and monitoring measures. However, the mitigation and monitoring measures are expected to minimize the potential for injury, such that take by Level A harassment is considered discountable.

If a marine mammal responds to a stimulus by changing its behavior (e.g., through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals or on the stock or species could potentially be significant (e.g., Lusseau and Bejder, 2007; Weilgart, 2007). Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound.

This practice potentially overestimates the numbers of marine mammals taken, as it is often difficult to distinguish between the individual animals harassed and incidences of harassment. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of

residency or site fidelity and the impetus to use the site (e.g., because of foraging opportunities) is stronger than the deterrence presented by the harassing activity. The Steller sea lions and harbor seals expected to occur in the project area are not branded, thus we expect that the identification of individual animals, even by experienced MMOs, would be extremely difficult. This would further increase the likelihood that repeated exposures of an individual, even within the same day, could be recorded as multiple takes.

UniSea requested authorization for the incidental taking of small numbers of Steller sea lions and harbor seals that may result from pile driving activities associated with the dock construction project described previously in this document. In order to estimate the incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by the activity and then incorporate information about marine mammal density or abundance in the project area. We first provide information on applicable sound thresholds for determining effects to marine mammals before describing the information used in estimating the sound fields, the available marine mammal density or abundance information, and the method of estimating incidences of take.

Sound Thresholds

We use generic sound exposure thresholds to determine when an activity that produces sound might result in impacts to a marine mammal such that a "take" by harassment might occur. To date, no studies have been conducted that explicitly examine impacts to marine mammals from pile driving sounds or from which empirical sound thresholds have been established. These thresholds should be considered guidelines for estimating when harassment may occur (i.e., when an animal is exposed to levels equal to or exceeding the relevant criterion) in specific

contexts; however, useful contextual information that may inform our assessment of effects is typically lacking and we consider these thresholds as step functions. NMFS is currently revising these acoustic guidelines; for more information on that process, please see: *www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*.

Table 2. Current NMFS acoustic exposure criteria.

Criterion	Definition	Threshold
Level A harassment (underwater)	Injury (PTS – any level above that which is known to cause TTS)	180 dB (cetaceans) / 190 dB (pinnipeds) (rms)
Level B harassment (underwater)	Behavioral disruption	160 dB (impulsive source*) / 120 dB (continuous source*) (rms)
Level B harassment (airborne)**	Behavioral disruption	90 dB (harbor seals) / 100 dB (other pinnipeds) (unweighted)

* Impact pile driving produces impulsive noise; vibratory pile driving produces non-pulsed (continuous) noise.
** NMFS has not established any formal criteria for harassment resulting from exposure to airborne sound. However, these thresholds represent the best available information regarding the effects of pinniped exposure to such sound and NMFS' practice is to associate exposure at these levels with Level B harassment.

Distance to Sound Thresholds

Underwater Sound Propagation Formula – Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * \log_{10}(R_1/R_2)$, where

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent

on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log[range]). A practical spreading value of fifteen is often used under conditions, such as Iliuliuk Harbor, where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) is assumed here.

Underwater Sound – The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity occurs. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at the UniSea dock, studies with similar properties to the specified activity were evaluated. See Section 5 of UniSea's IHA application for a detailed description of the information considered in determining reasonable proxy source level values. UniSea used representative source levels of 165 dB rms for installation of steel sheet piles using a vibratory hammer (CalTrans 2012), 163 dB rms for vibratory removal and installation of a 24-inch steel pile (Rodkin 2013), 189 dB rms for impact pile driving of a 24-inch steel pile (CalTrans 2012), and 165 dB (re: 1 μPa at 1m) at 200 Hz for

down-the-hole drilling (URS 2011). The representative source level of 189 dB rms for impact pile driving of a 24-inch steel pile represents a change from the proposed IHA published in the **Federal Register** on December 23, 2015 (80 FR 79822), in which a representative source level of 184 dB rms was proposed as a proxy source level; during the 30 day public comment period, NMFS determined that the best available information suggested 189 dB represented a more accurate source level for impact pile driving (CalTrans 2012).

Table 3. Modeled distances from G1 dock to NMFS Level A and Level B harassment thresholds (isopleths) during pile installation and removal.

Threshold	**Distance (meters) ***
Impact driving, pinniped injury (190 dB)	8.6 **
Impact driving, pinniped disturbance (160 dB)	900
Vibratory driving, pinniped injury (190 dB)	0.215 **
Vibratory driving or down-the-hole drilling, pinniped disturbance (120 dB)	10,000
Vibratory removal, pinniped injury (160 dB)	0.158 m **
Vibratory removal, pinniped disturbance (120 dB)	7,400

*Distances shown are modeled maximum distances and do not account for landmasses which are expected to reduce the actual distances to sound thresholds.
**These are modeled distances to the Level A harassment threshold, however the Level A zone will conservatively extend to 10 m radius, thus any marine mammal within, or approaching, a 10 m radius of the pile being driven would trigger a shutdown of construction.

Iliuliuk Harbor does not represent open water, or free field, conditions. Therefore, sounds would attenuate as they encounter land masses. As a result, and as described above, pile driving noise in the project area is not expected to propagate to the calculated distances for the 160 dB or 120 dB thresholds as shown in Table 3. See Appendix B of UniSea's IHA application for figures depicting the actual extents of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving, taking into account the attenuation provided by landmasses.

Airborne Sound – Pile driving can generate airborne sound that could potentially result in disturbance to pinnipeds that are hauled out or at the water's surface. As a result, UniSea analyzed the potential for pinnipeds hauled out or swimming at the surface near the G1 dock to be exposed to airborne SPLs that could result in Level B behavioral harassment. A spherical spreading loss model (i.e., 6 dB reduction in sound level for each doubling of distance from the source), in which there is a perfectly unobstructed (free-field) environment not limited by depth or water surface, is appropriate for use with airborne sound and was used to estimate the distance to the airborne thresholds.

As discussed above regarding underwater sound from pile driving, the intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity occurs. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at Iliuliuk Harbor, studies with similar properties to the UniSea G1 dock construction project, as described previously, were evaluated. UniSea used representative source levels of 100 dB Leq/rms at 22 m for vibratory removal and installation of a 24-inch steel pile and 100 dB Leq/rms at 26 m for impact driven 24-inch steel piles. Please see Section 5 of UniSea's IHA application for details of the information considered. These values result in a disturbance zone (radial distance) of 3.16 m for harbor seals and 1.0 m for Steller sea lions. No data was found for the airborne sound levels expected from the installation of steel sheet piles or 18-inch steel piles, but sound levels from the installation of steel sheet piles and 18-inch steel piles are likely to be within a similar range as sound levels mentioned above.

Despite the modeled distances described above, no incidents of incidental take resulting solely from airborne sound are likely, as distances to the harassment thresholds would not reach areas where pinnipeds are known to haul out in the area of the project. Harbor seal haulout locations may change slightly depending on weather patterns, human disturbance, or prey availability, but the closest known harbor seal haulout to the project location is on the north side of Hog island, located west of Amaknak Island in Unalaska Bay, approximately 3 km from the G1 dock (pers. comm., L. Fritz, NMML, to J. Carduner, NMFS, Oct 30, 2015). Steller sea lions have greater site fidelity than harbor seals; the closest known Steller sea lion haulout is at Priest Rock, a point that juts into the Bering Sea on the northeastern corner of Unalaska Bay, approximately 20 km from the project site (pers. comm., L. Fritz, NMML, to J. Carduner, NMFS, Oct 30, 2015).

We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when their heads are above the water's surface. However, these animals would previously have been "taken" as a result of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Multiple incidents of exposure to sound above NMFS' thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction. Therefore, authorization of incidental take resulting from airborne sound for pinnipeds is not warranted, and airborne sound is not discussed further.

Marine Mammal Occurrence

The most appropriate information available was used to estimate the number of potential incidences of take. Density estimates for Steller sea lions and harbor seals in Iliuliuk Harbor, and more broadly in the waters surrounding Unalaska Island, are not readily available. Likewise, we were not able to find any published literature or reports describing densities or estimating abundance of either species in the project area. As such, data collected from marine mammal surveys represent the best available information on the occurrence of both species in the project area.

Beginning in April 2015, UniSea personnel began conducting marine mammal surveys of Iliuliuk Harbor under the direction of an ecological consultant. Observers recorded data on all marine mammals that were observed, including Steller sea lions, whales, and harbor seals. Both stationary and roving observations occurred within a 1,000 m radius of the project site (see Figure 9 in the IHA application for a depiction of survey points and marine mammal observations). A combination of two of the stationary observation points were surveyed each day, for a total of 15 minutes at each point, and the roving route was checked once per day over a time span of 15 minutes, covering areas between the docks that were too difficult to see from the stationary points. The survey recorded the number of animals observed, the species, their primary activity, and any additional notes. From January through October 2015, a total of 323 Steller sea lions and 33 harbor seals were observed during 1,432 separate observations over the course of 358 hours of surveys. These surveys represent the most recent data on marine mammal occurrence in the harbor, and represent the only targeted marine mammal surveys of the project area that we are aware of.

Data from bird surveys of Iliuliuk Harbor conducted by the U.S. Army Corps of Engineers (USACE) from 2001-2007, which included observations of marine mammals in the harbor, were also available; however, we determined that these data were unreliable as a basis for prediction of marine mammal abundance in the project location as the goal of the USACE surveys was to develop a snapshot of waterfowl and seabird location and abundance in the harbor, thus the surveys would have been designed and carried out differently if the goal had been to document marine mammal use of the harbor (pers. comm., C. Hoffman, USACE, to J. Carduner, NMFS, October 26, 2015). Additionally, USACE surveys occurred only in winter; as Steller sea lion abundance is expected to vary significantly between the breeding and the non-breeding season in the project location, data that were collected only during the non-breeding season have limited utility in predicting year-round abundance. As such, we determined that the data from the surveys commissioned by UniSea in 2015 represents the best available information on marine mammals in the project location.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in the project location. Density data for marine mammal species in the project location is not available. Therefore the data collected from marine mammal surveys of Iliuliuk Harbor in 2015 represent the best available information on marine mammal populations in the project location, and this data was used to estimate take. As such, the zones that have been calculated to contain the areas ensonified to the Level A and Level B thresholds for pinnipeds have been calculated for mitigation and monitoring purposes and were not used in the calculation

of take. See Table 4 for total estimated incidents of take. Estimates were based on the following assumptions:

- All marine mammals estimated to be in areas ensonified by noise exceeding the Level B harassment threshold for impact and vibratory driving (as shown in Appendix B of the IHA application) are assumed to be in the water 100% of the time. This assumption is based on the fact that there are no haulouts or rookeries within the area predicted to be ensonified to the Level B harassment threshold based on modeling.
- Predicted exposures were based on total estimated total duration of pile driving/removal hours, which are estimated at 1,080 hours over the entire project. This estimate is based on a 180 day project time frame, an average work day of 12 hours (work days may be longer than 12 hours in summer and shorter than 12 hours in winter), and an estimate that approximately 50% of time during those work days will include pile driving and removal activities (with the other 50% of work days spent on non-pile driving activities which will not result in marine mammal take, such as installing templating and bracing, moving equipment, etc.).
- Vibratory or impact driving could occur at any time during the "duration" and our approach to take calculation assumes a rate of occurrence that is the same for any of the calculated zones.
- The hourly marine mammal observation rate recorded during marine mammal surveys of Iliuliuk Harbor in 2015 is reflective of the hourly rate that will be observed during the construction project.
- Takes were calculated based on estimated rates of occurrence for each species in the project area and this rate was assumed to be the same regardless of the size of the zone (for impact or vibratory driving/removal).
- Activities that may be accomplished by either impact driving or down-the-hole drilling (i.e. fender support/pin piles, miscellaneous support piles, and temporary support piles) were assumed to be accomplished via impact driving. If any of these activities are ultimately accomplished via down-the-hole drilling instead of impact driving, this would not result in a change in the amount of overall effort (as they will be accomplished via down-the-hole drilling instead of, and not in addition to, impact driving). As take

estimates are calculated based on effort and not marine mammal densities, this would not change the take estimate.

Take estimates for Steller sea lions and harbor seals were calculated using the following series of steps:

1. The average hourly rate of animals observed during 2015 marine mammal surveys of Iliuliuk Harbor was calculated separately for both species ("Observation Rate"). Thus "Observation Rate" (OR) = No. of individuals observed / hours of observation;
2. The 95% confidence interval was calculated for the data set, and the upper bound of the 95% confidence interval was added to the Observation Rate to account for variability of the small data set ("Exposure Rate"). Thus "Exposure Rate" (XR) = $\mu_{OR} + CI_{95}$ (where μ_{OR} = average of monthly observation rates and CI_{95} = 95% confidence interval (normal distribution);
3. The total estimated hours of pile driving work over the entire project was calculated, as described above ("Duration"); Thus "Duration" = total number of work days (180) * average work hours per day (12) * percentage of pile driving time during work days (0.5) = total work hours for the project (1,080); and
4. The estimated number of exposures was calculated by multiplying the "Duration" by the estimated "Exposure Rate" for each species. Thus, estimated takes = Duration * XR.

Please refer to Appendix G of the IHA application for a more thorough description of the statistical analysis of the observation data from marine mammal surveys.

Steller Sea Lion – Steller sea lion density data for the project area is not available. Steller sea lions occur year-round in the Aleutian Islands and within Unalaska Bay and Iliuliuk Harbor. As described above, local abundance in the non-breeding season (winter months) is generally lower overall; data from surveys conducted by UniSea in 2015 revealed Steller sea lions were present in Iliuliuk Harbor in all months that surveys occurred. We assume, based on marine

mammal surveys of Iliuliuk Harbor, and based on the best available information on seasonal abundance patterns of the species including over 20 years of NMML survey data collected in Unalaska, that Steller sea lions will be regularly observed in the project area during all months of construction. As described above, all Steller sea lions in the project area at a given time are assumed to be in the water, thus any sea lion within the modeled area of ensonification exceeding the Level B harassment threshold would be recorded as taken by Level B harassment.

Estimated take of Steller sea lions was calculated using the equations described above, as follows:

μ_{OR} = 1.219 individuals/hr

CI_{95} = 0.798

XR = 2.016

Estimated exposures (Level B harassment) = 2.016 * 1,080 = 2,177

Thus we estimate that a total of 2,177 Steller sea lion takes will occur as a result of the UniSea G1 dock construction project (Table 4).

Harbor Seal – Harbor seal density data for the project location is not available. We assume, based on the best on the best available information, that harbor seals will be encountered in low numbers throughout the duration of the project. We relied on the best available information to estimate take of harbor seals, which in this case was survey data collected from the 2015 marine mammal surveys of Iliuliuk Harbor as described above. That survey data showed harbor seals are present in the harbor only occasionally, with only 33 seals observed over the entire survey. NMML surveys have not been performed in Iliuliuk Harbor, but the most recent NMML surveys of Unalaska Bay confirm that harbor seals are present in the area in

relatively small numbers, with the most recent haulout counts in Unalaska Bay (2008-11) recording no more than 19 individuals at the three known haulouts there. NMML surveys have been limited to the months of July and August, so it is not known whether harbor seal abundance in the project area varies seasonally. The 2015 marine mammal surveys of Iliuliuk Harbor showed numbers of harbor seals in the harbor increasing from July through October, but the sample size for those months was extremely small (n=30). As described above, all harbor seals in the project area at a given time are assumed to be in the water, thus any harbor seals within the modeled area of ensonification exceeding the Level B harassment threshold would be recorded as taken by Level B harassment.

Estimated take of harbor seals was calculated using the equations described above, as follows:

μ_{OR} = 0.171 individuals/hr

CI_{95} = 0.185

XR = 0.356

Estimated exposures (Level B harassment) = 0.356 * 1,080 hours = 385

Thus we estimate that a total of 385 harbor seal takes will occur as a result of the UniSea G1 dock construction project (Table 4).

We therefore authorize the take, by Level B harassment only, of a total of 2,177 Steller sea lions (western DPS) and 385 harbor seals (Aleutian Islands stock) as a result of the UniSea G1 dock construction project. These take estimates are considered reasonable estimates of the number of marine mammal exposures to sound above the Level B harassment threshold that are likely to occur over the course of the project, and not the number of individual animals exposed.

For instance, for pinnipeds that associate fishing boats in Iliuliuk Harbor with reliable sources of food, there will almost certainly be some overlap in individuals present day-to-day depending on the number of vessels entering the harbor, however each instance of exposure for these individuals will be recorded as a separate, additional take. Moreover, because we anticipate that marine mammal observers will typically be unable to determine from field observations whether the same or different individuals are being exposed over the course of a workday, each observation of a marine mammal will be recorded as a new take, although an individual theoretically would only be considered as taken once in a given day.

Table 4. Number of authorized incidental takes of marine mammals, and percentage of stock abundance, as a result of the G1 dock construction project.

Species	Underwater*		Percentage of stock abundance
	Level A	Level B (120 dB)	
Steller sea lion	0	2,177	4%
Harbor seal	0	385	11%

* We assume, for reasons described earlier, that no takes would occur as a result of airborne noise.

Analyses and Determinations

Negligible Impact Analysis

NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (i.e., population-level effects). An estimate of the number of Level B harassment takes alone is not enough information on which to base an impact determination. In

addition to considering estimates of the number of marine mammals that might be "taken" through behavioral harassment, we consider other factors, such as the likely nature of any responses (e.g., intensity, duration), the context of any responses (e.g., critical reproductive time or location, migration), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and effects on habitat.

Pile driving activities associated with the UniSea G1 dock construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Takes could occur if marine mammals are present in the Level B harassment zone when pile driving is happening, which is likely to occur because: (1) Steller sea lions have established haulouts near Iliuliuk Harbor and are frequently observed in Iliuliuk Harbor, in varying numbers depending on season and prey availability, and probably associate fishing boats entering the harbor with reliable food sources; and (2) harbor seals are observed in Iliuliuk Harbor occasionally and are known to haulout at sites outside the harbor, including one site approximately 3 km from the project location.

No serious injury or mortality of marine mammals would be anticipated as a result of vibratory and impact pile driving, regardless of mitigation and monitoring measures. Vibratory hammers do not have significant potential to cause injury to marine mammals due to the relatively low source levels produced (less than 180 dB rms) and the lack of potentially injurious source characteristics. Impact pile driving produces short, sharp pulses with higher peak levels than vibratory driving and much sharper rise time to reach those peaks. The potential for injury

that may otherwise result from exposure to noise associated with impact pile driving will effectively be minimized through the implementation of the planned mitigation measures. These measures include: the implementation of a Level A "exclusion zone", which is expected to eliminate the likelihood of marine mammal exposure to noise at received levels that could result in injury; the use of "soft start" before pile driving, which is expected to provide marine mammals near or within the zone of potential injury with sufficient time to vacate the area; and the use of a sound attenuation system which is expected to dampen the sharp, potentially injurious peaks associated with impact driving and to reduce the overall source level to some extent (it is difficult to predict the extent of attenuation provided as underwater recordings have not been performed for the type of bubble curtain proposed for use). We believe the required mitigation measures, which have been successfully implemented in similar pile driving projects, will minimize the possibility of injury that may otherwise exist as a result of impact pile driving.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from similar pile driving projects that have received incidental take authorizations from NMFS, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging. Most likely, individuals will simply move away from the sound source and be temporarily displaced from the area of pile driving (though even this reaction has been observed primarily in association with impact pile driving). In response to vibratory driving, harbor seals have been observed to orient towards and sometimes move towards the sound. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the

overall stock is unlikely to result in any significant realized decrease in fitness to those individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

No pinniped rookeries or haul-outs are present within the project area, and the project area is not known to provide foraging habitat of any special importance to either Steller sea lions or harbor seals (other than is afforded by the migration of salmonids to and from Iliuliuk Stream and the occasional availability of discarded fish from commercial fishing boats and fish processing facilities in the project area). No cetaceans are expected within the project area. While we are not aware of comparable construction projects in the project location, the pile driving activities analyzed here are similar to other in-water construction activities that have received incidental harassment authorizations previously, including projects at Naval Base Kitsap Bangor in Hood Canal, Washington, and at the Port of Friday Harbor in the San Juan Islands, which have occurred with no reported injuries or mortalities to marine mammals, and no known long-term adverse consequences to marine mammals from behavioral harassment.

In summary, this negligible impact analysis is founded on the following factors: (1) the possibility of injury, serious injury, or mortality may reasonably be considered discountable; (2) the anticipated incidences of Level B harassment consist of, at worst, temporary modifications in behavior; (3) the absence of any major rookeries and only a few isolated haulout areas near the project site; (4) the absence of any other known areas or features of special significance for foraging or reproduction within the project area; and (5) the presumed efficacy of planned

mitigation measures in reducing the effects of the specified activity to the level of least practicable impact. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individual animals. The specified activity is not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, we find that the total marine mammal take from UniSea's dock construction activities in Iliuliuk Harbor will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers Analysis

The numbers of animals authorized to be taken would be considered small relative to the relevant stocks or populations (4 percent and 11 percent for Steller sea lions and harbor seals, respectively) even if each estimated taking occurred to a new individual. However, the likelihood that each take would occur to a new individual is extremely low. As described above, for those sea lions that associate fishing boats with reliable sources of food, there will almost certainly be some overlap in individuals present day-to-day depending on the number of vessels entering the harbor. It is expected that operations at a separate, nearby UniSea dock and the associated UniSea processing facilities, as well as at seafood processing facilities owned by other companies based in Iliuliuk Harbor, will continue as usual during construction on the G1 dock, so it is likely that sea lions accustomed to seeking food at these facilities will continue to be attracted to the area during portions of the construction activities.

Further, these takes are likely to occur only within some small portion of the overall regional stock. For example, of the estimated 55,422 western DPS Steller sea lions throughout Alaska, there are probably no more than 300 individuals with site fidelity to the three haulouts located nearest to the project location, based on over twenty years of NMML survey data (see "Description of Marine Mammals in the Area of the Specified Activity" above). For harbor seals, NMML survey data suggest there are likely no more than 60 individuals that use the three haulouts nearest to the project location (the only haulouts in Unalaska Bay). Thus the estimate of take is an estimate of the number of anticipated exposures, rather than an estimate of the number of individuals that will be taken, as we expect the majority of exposures would be repeat exposures that would accrue to the same individuals. As such, the authorized takes represent a much smaller number of individuals of both Steller sea lions and harbor seals, in relation to total stock sizes.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, we find that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

Subsistence hunting and fishing is an important part of the history and culture of Unalaska Island. However, the number of Steller sea lions and harbor seals harvested in Unalaska decreased from 1994 through 2008; in 2008, the last year for which data is available, there were no Steller sea lions or harbor seals reported as harvested for subsistence use. Data on pinnipeds hunted for subsistence use in Unalaska has not been collected since 2008. For a

summary of data on pinniped harvests in Unalaska from 1994-2008, see Section 8 of the IHA application.

Aside from the apparently decreasing rate of subsistence hunting in Unalaska, Iliuliuk Harbor is not likely to be used for subsistence hunting or fishing due to its industrial nature, with several fish processing facilities located along the shoreline of the harbor. In addition, the UniSea G1 dock construction project is likely to result only in short-term, temporary impacts to pinnipeds in the form of possible behavior changes, and is not expected to result in the injury or death of any marine mammal. As such, the project is not likely to adversely impact the availability of any marine mammal species or stocks that may otherwise be used for subsistence purposes.

National Environmental Policy Act (NEPA)

NMFS prepared an Environmental Assessment (EA) in February, 2016, titled "*Issuance of an Incidental Harassment Authorization to UniSea, Inc., to Take Marine Mammals by Harassment Incidental to Construction Activities on Unalaska Island, Alaska, March 2016 – February 2017*." A Finding of No Significant Impact (FONSI) was signed on February 12, 2016. In the FONSI, NMFS determined that the issuance of the IHA for the take, by harassment, of small numbers of marine mammals incidental to the UniSea's dock construction project in Unalaska, AK, will not significantly impact the quality of the human environment, as described in this document and in the UniSea EA. The EA and FONSI can be found at: *http://www.nmfs.noaa.gov/pr/permits/incidental/*.

Endangered Species Act (ESA)

There is one marine mammal species (western DPS Steller sea lion) with confirmed occurrence in the project area that is listed as endangered under the ESA. The NMFS Alaska Regional Office Protected Resources Division issued a Biological Opinion on February 16, 2016, under section 7 of the ESA, on the issuance of an IHA to UniSea under section 101(a)(5)(D) of the MMPA by the NMFS Permits and Conservation Division. The Biological Opinion concluded that the proposed action is not likely to jeopardize the continued existence of western DPS Steller sea lions, and is not likely to destroy or adversely modify western DPS Steller sea lion critical habitat.

Authorization

NMFS has issued an IHA to UniSea for the potential harassment of small numbers of two marine mammal species incidental to the G1 dock construction project in Unalaska, Alaska, provided the previously mentioned mitigation.

Dated: February 19, 2016.

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